

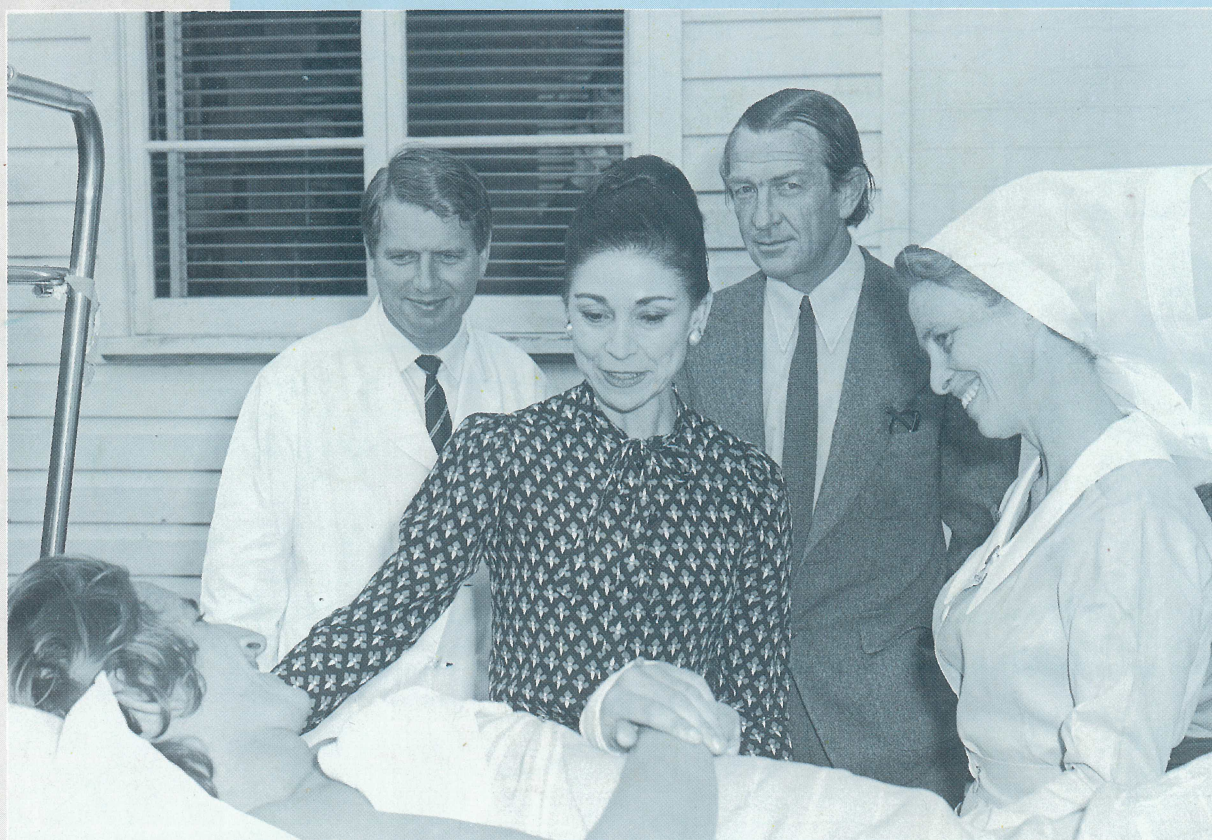
RNS

**ROYAL NORTH
SHORE HOSPITAL
SYDNEY**

**20 YEARS OF
RESEARCH IN
SPINAL INJURIES
TO 1987**

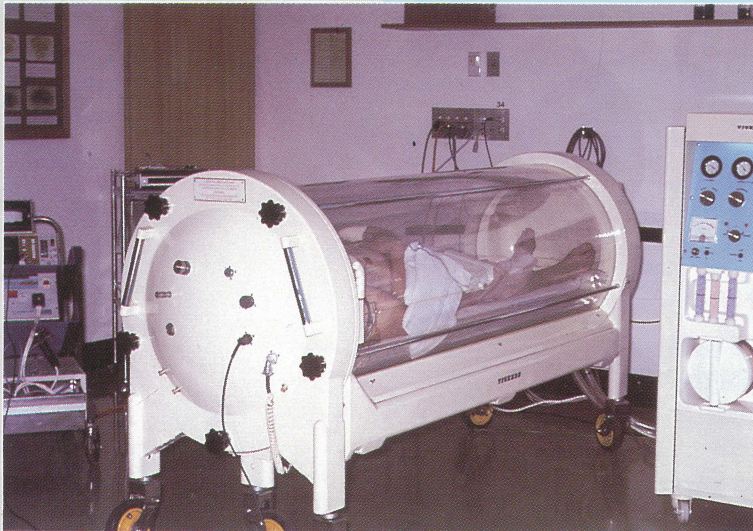
The Spinal Injuries and Rehabilitation Clinic has been at the Royal North Shore Hospital for over 30 years. Dr. J. M.F. Grant, O.B.E., Senior Neuro-surgeon developed the Unit in those early years and gathered around him a team of dedicated nurses, physiotherapists, occupational therapists, social workers, splint makers and many voluntary helpers. Specialised surgery and nursing care was followed by medical, social and vocational rehabilitation. Dr. John Yeo, A.O., was appointed Medical Director to the Spinal Injuries Unit in 1968. During these last 20 years improvements have been achieved in medical and nursing care with development of special equipment for assisting the paralysed in the rehabilitation programmes. Specialised professionals have also joined the team, such as the Biomedical Engineer, Surgical Dressers trained for special duties and highly skilled nursing staff with expertise in intensive care and assisting patients and relatives in the challenging adjustment to permanent disability. Over 1800 patients have now received treatment through this Unit.

During the last 20 years basic and applied research has continued in an effort to improve the degree of recovery from paralysis following serious injury to the spinal cord. Research has improved appliances and wheelchairs to allow better function and mobility for those suffering from paraplegia or quadriplegia. In recent years the 'microchip' has vastly improved the potential for those with serious handicaps. The community has become more aware of the needs of those with disability, improving access to public buildings and homes, providing accommodation, the opportunity for schooling and further education.



Dame Margot Fonteyn visits the old Spinal Unit in 1971 with Dr. J. M. F. Grant, Sr. N. Joyce, and Dr. J. D. Yeo.

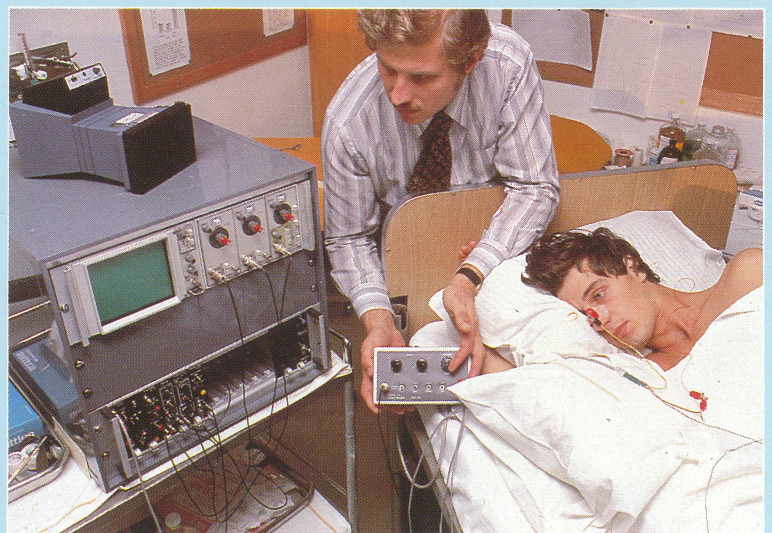
SPINAL



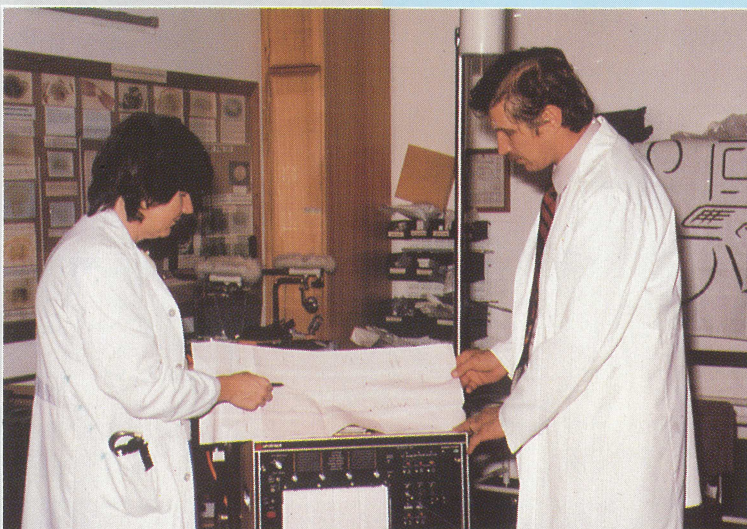
LEFT: The Hyperbaric Oxygen Chamber, capable of increasing the pressure to 2.5 ATA resulting in increased oxygenation to the injured spinal cord.



LEFT: Peter demonstrates his ability to stand, though paralysed, with the assistance of programmed Electrical Stimulation to the muscles of the thighs.



ABOVE: Sensory Evoked Potentials are being used to help obtain a more objective diagnosis on the state of injury to the spinal cord in the acute phase.



LEFT: Dr. Sue Rutkowski, Staff Specialist in the Spinal Unit with Mr. Robert Bosshard, Biomedical Engineer discussing the result of Urodynamic studies in the Research Laboratory.

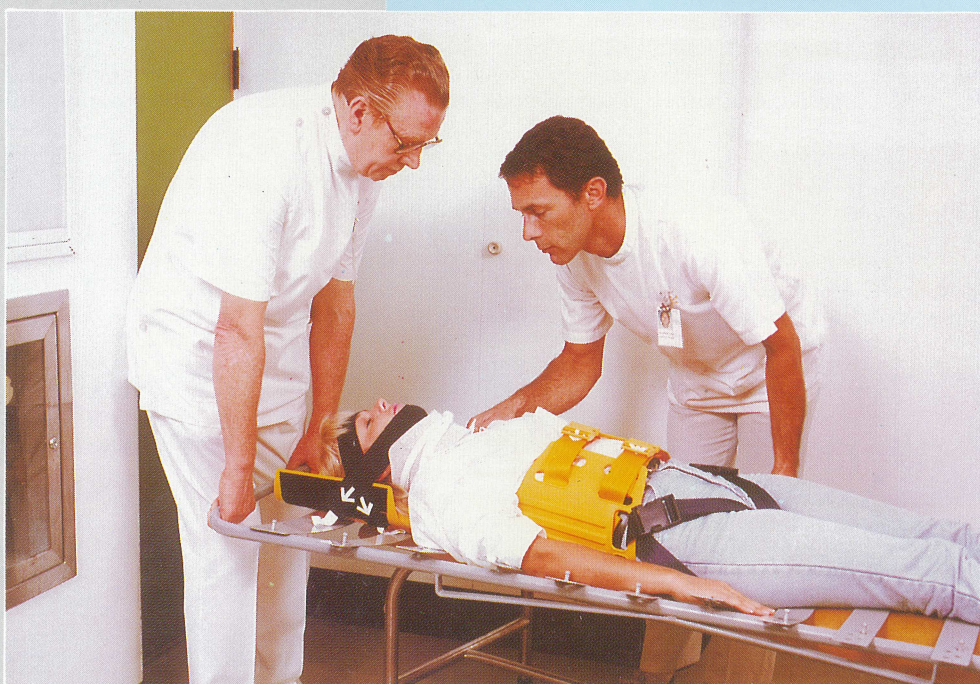
RESEARCH



LEFT: The revolutionary plastic lightweight wheelchair for use in this country and in the South Pacific Islands.



ABOVE: A patient learns to communicate with the assistance from the Apple Macintosh Computer, using chin controls and a specially designed desk.



LEFT: The Russell Extrication Device, developed to enable the seriously injured motor vehicle accident victim to be transferred without further damage to the spinal cord.

Mr. Robert Bosshard and Dr. John Yeo have travelled to many Spinal and Research Centres overseas including China, Russia, the U.S.A., Canada, the United Kingdom, Europe, South East Asia, Israel and India. The Unit continues to communicate with these centres and share in the results of research being carried out here and overseas.

AWARENESS AND PREVENTION

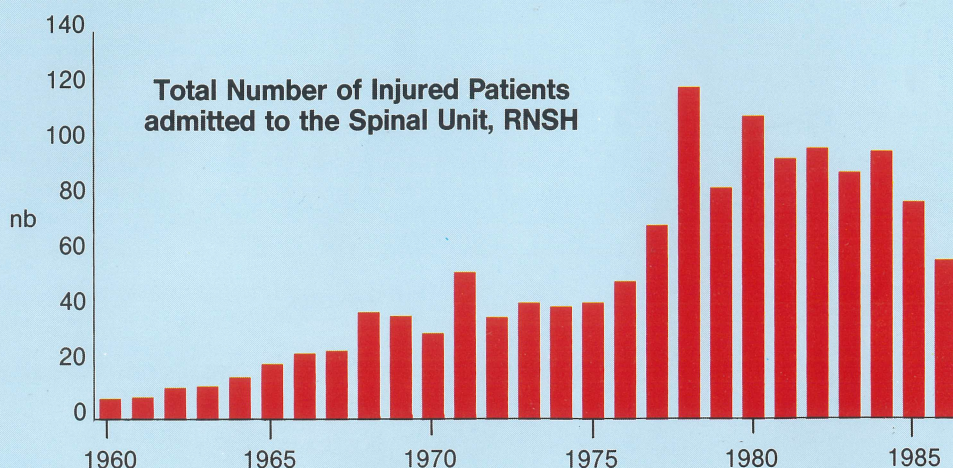


LEFT: Mr. Errol Hyde and Mr. Fabian Blattman with a class of enthusiastic youngsters, keen to learn what the spinal column looks like, and how delicate the spinal cord really is.



LEFT: Over the last five years the Awareness and Prevention Team have reached over 200,000 school children. The Team is co-ordinated with five lecturers in wheelchairs presenting advice on how to enjoy life while avoiding some of the serious dangers which could lead to spinal cord injury. The community has become more aware of these dangers and the incidence of spinal cord injury in our community is now falling.

BELOW: Up until recently we could expect 150 patients admitted with serious spinal injuries each year. 150 families would be faced with this serious challenge. Hopefully the incidence of spinal cord injury will continue to fall through the impact of the Awareness and Prevention Lecture Team.



SPINAL INJURIES RESEARCH TEAM



LEFT: John D. Yeo, A.O., M.B., M.S., D.P.R.M., F.R.A.C.S., F.A.C.R.M.,
Medical Director

John D. Yeo, A.O., M.B., M.S., D.P.R.M., F.R.A.C.S., F.A.C.R.M.,
Medical Director

Sue Rutkowski, M.B., B.S., Staff Specialist.

Robert Bosshard, D.Eng., (E.P.F.) M.Sc., I.B.M.E., I.E.E.E.

Margaret Davis, Secretary.

RESEARCH ASSISTANTS: Con Poulos, M.B.,
B.S., Sr. Angela Adams, Sr. Anne Fuller, Ray
Sherwood, Ray Kearns, Sue Ambuhl, B.Sc.,
Stephanie Stabback B.Sc.

AWARENESS & PREVENTION TEAM

Lyn Ryan, B.A., Dip. Teach. Co-ordinator.

LECTURERS: Errol Hyde (Leader), Fabian
Blattman, Jeffrey St. John, Richard
Cordukes, Robert Staddon.

VOLUNTARY WORKERS

Vivienne Inder, Donal McGrane.

CONSULTANTS

Drs. John M. F. Grant, Douglas Keller,
Christopher Lowry, Stephen Hunyor, William
Payne, Jean McPhail, Anthony D. Kidman, J.
R. S. Hales.

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Over these last 20 years your help and encouragement have enabled clinical and research teams to improve treatment techniques, assist the patient to overcome disability, demonstrating improved ability and lessening the impact of this devastating injury to individuals, their families and the community.

PUBLICATIONS

Studies on the Levels of 17 Hydroxy-Corticoids in 24 Hour Specimens of Urine from Five Quadriplegic Patients and Two Paraplegic Patients Admitted to the Royal North Shore Hospital of Sydney.

Grant, J. M. F., Yeo, J. D. *Journal of Paraplegia*, Vol. 6. No. 1. May 1968.

Controlled Experimental Contusion of the Spinal Cord in Sheep. Yeo, J. D., Payne, W. H. and Collins, L. T. *Proceedings of the Surgical Research Society of Australasian Meeting, Australian and New Zealand Journal of Surgery*. Vol. 41. No. 1. Pages 89-90, 1971.

Preliminary Report on the Effect of Distigmine Bromide on the Neurogenic Bladder. Yeo, J. D., Southwell, P. and Hindmarsh, E. *Medical Journal of Australia*, Vol. 1. Page 116. January 1973.

Cystometry - A Diagnostic and Functional Aid for the Patient with a Neurogenic Bladder. Yeo, J. D. *Medical Journal of Australia*, Vol. 1. Page 983. May 1973.

A Further Report on the Effect of Distigmine Bromide (Ubretid) on the Neurogenic Bladder. Yeo, J. D., Southwell, P., Rutkowski, S. and Marchant-Williams, H. *Medical Journal of Australia*, Vol. 2. Page 201.

Catecholamine Levels in the Sheep's Spinal Cord Following Trauma. Hinwood, B., Kidman, A. and Yeo, J. D. *Proceedings of the Australian Biochemistry Society*, Vol. 7. Page 9. 1974.

The Experimental Contusion Injury of the Spinal Cord in Sheep. Yeo, J. D., Payne, W., Hinwood, D. and Kidman, A. *Paraplegia*, Vol. 12. Page 275. 1975.

The Sequential Pathological Changes in the Experimental Contusion Injury of the Spinal Cord - Abstract. Yeo, J. D., Kidman, A. and Hinwood, B. *Journal of Bone and Joint Surgery (Br)* 57 (2). May 1975.

Experimental Contusion Injury of the Spinal Cord in Sheep. Yeo, J. D., Payne, W., Hinwood, B. and Kidman, A. *Proceedings of the Australian Society for Medical Research, Clinical and Experimental Pharmacology and Physiology*. Vol. 2. Page 78. 1975.

The Sequential Pathological Changes Seen in Controlled Trauma to the Spinal Cord of the Sheep. Yeo, J. D., Payne, W. H. *Annual Meeting Royal College of Pathologists of Australia, Auckland, N.Z. J. Pathology*. No. 1. Vol. 7. Page 66. 1975.

Treatment of Paraplegic Sheep with Hyperbaric Oxygen - a Preliminary Report. Yeo, J. D., McKenzie, B., Hinwood, B. and Kidman, A. *Medical Journal of Australia*. Vol. 1. Page 538. 1976.

Concentrations of NE and 5-HT in the Contused Sheep Spinal Cord: Status of the Monoamine Hypothesis. Kidman, A. D., Hinwood, B. G. and Yeo, J. D. *Journal of Neurochemistry*. Vol. 27. Pages 293-294. 1976.

Central Necrosis Following Contusion to the Sheep's Spinal Cord. Yeo, J. D., Stabback, S. and McKenzie, B. *Paraplegia* 14. Pages 274-283. 1977.

A Study of the Effects of Hyperbaric Oxygen on the Experimental Spinal Cord Injury. Yeo, J. D., Stabback, S. and McKenzie, B. *Medical Journal of Australia*. Vol. 2. Pages 145-147. 1977.

Experimental Spinal Cord Injury. Yeo, J. D., Stabback, S. and McKenzie, B. *Proceedings 6th International Congress on Hyperbaric Medicine*. Pages 223-232. Aberdeen, Scotland. 1977.

Preliminary Report on Ten Patients with Spinal Cord Injuries Treated with Hyperbaric Oxygen. Yeo, J. D. *Medical Journal of Australia*. Vol. 2. Pages 572-573. 1978.

Five-year Review of Spinal Cord Injuries in Motor Cyclists. Yeo, J. D. *Medical Journal of Australia*. Vol. 2. Page 381. 1979.

Spasticity - Pathophysiology, Clinical Presentation and Treatment. Yeo, J. D. *Proc. Rehabilitation in Some Neurological Disorders, Coppleston Postgraduate Medical Inst. Uni. of Sydney*. September 22. 1979.

Monitoring the Residual Function of the Injured Human Spinal Cord with Sensory Evoked Potentials. Bosshard, R. G. and Yeo, J. D. *Australian Phys. & Engineer. Sciences in Medicine*. Vol. 3-1. No. 86. January/February 1980.

Spinal Cord Injuries in Motor Cyclists. Yeo, J. D. *The Journal of the Western Pacific Orthopaedic Association*. Vol. XVII No. 1. June 1980.

Monoamine and Tissue Fluid Levels in Contused Spinal Cord of Sheep. Hinwood, B. G., Yeo, J. D. and Kidman, A. D. *Journal of Neurochemistry*, 35 (4). Pages 786-791. October 1980.

Effects of Anesthesia and Laminectomy on Regional Spinal Cord Blood Flow in Conscious Sheep. Hales, J. R. S., Yeo, J. D., Stabback, S., Fawcett, A. and Kearns, R. *Journal of Neurosurgery*. Vol. 54. No. 5. May 1981.

Low Cost Wheelchair. Bosshard, R. G. and Yeo, J. D. *Paraplegia* 21. 1983.

The Use of Hyperbaric Oxygen in Recent Spinal Cord Injury. Yeo, J. D., Lowry, C. *HBO Review*. Vol. 5. No. 1. Pages 54-59. January 1984.

The Use of Hyperbaric Oxygen to Modify the Effects of Recent Contusion Injury to the Spinal Cord. Yeo, J. D. *Central Nervous System Trauma*. Vol. 1. No. 2. 1984.

Effects of a Contusion Injury on Spinal Cord Blood Flow in the Sheep. Yeo, J. D., Robert Hales, Stefanie Stabback, Bradley, S., Alan Fawcett, Raymond Kearns. *Spine*. Vol. 9. No. 7. 1984.

Sensory Evoked Potentials and Information Processing in Spinal Cord Injury. Bosshard, R. G. *Master of Science Thesis* 1984.

A Practical Approach to Functional Electrical Stimulation - Balancing The Case. Yeo, J. D., Bosshard, R. G., McPhail, J. *Ten Years of Spinal Research*, Hobart, May 1986.

Communicating With Computers - The User Friendly Talk Back Show. Bosshard, R. G. and Yeo, J. D. *Ten Years of Spinal Research*, Hobart, May 1986.

Macintosh and the Disabled. Bosshard, R. G. *Australian Macworld*, June/July 1986. Pages 84-89.

Functional Electrical Stimulation. McPhail, J., Bosshard, R. G., Yeo, J. D. *In Advances in Technology for people with disabilities. The Institution of Engineers. Australian Symposium*. June 1986.

Electrical Stimulation and Paraplegia. Bosshard, R. G., McPhail, J., Yeo, J. D. *Engineering and the Physical Sciences in Medicine*. August 1986.